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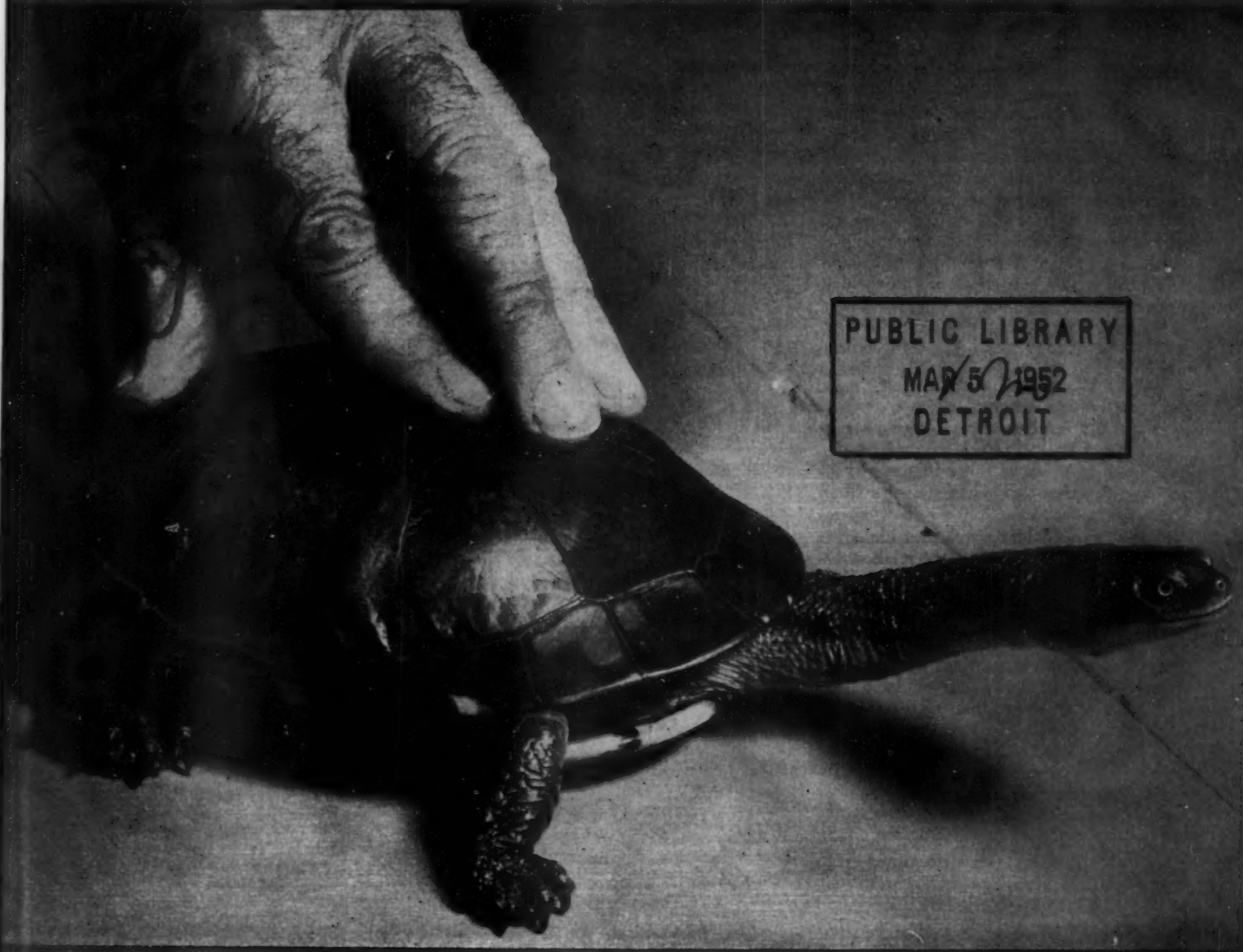
March 1, 1952

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



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DETROIT

Long-Necked Travellers

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VOL. 61 NO. 9 PAGES 129-144

BIOPHYSICS

Radioactive Hydrogen Tag

Tritium, triple weight hydrogen, found suitable for use as chemical label tracing biological reactions in two independently conducted studies.

➤ MEDICAL SCIENTISTS now have another radioactive chemical they can use as a "tag" or label for tracing food and medicines in the body and seeing how the body handles them in health and sickness.

The chemical is tritium, or radioactive triple weight hydrogen. Before using a radioactive substance for this tracer job, scientists must be sure it is safe to give a person.

Studies at the Argonne National Laboratory in Chicago show that tritium "is no more dangerous than better known forms of radiation."

The conclusion as to tritium's suitability for use as a chemical tag in biological research comes from two independently conducted studies. In one Dr. E. L. Powers, Jr., and Mrs. Deborah Shefner sealed single-celled, slipper-shaped animals, called paramecia, in deep depression glass slides which contained tritium water. During their life in the slide, the little animals were constantly exposed to the radiation given off by the tritium.

Examination after 48 hours of this life in tritium showed the animals had not been damaged any more than they would have been as a result of exposure to X-rays, atomic fission products and other radioactive materials. During the 48 hours of the experiment 500 to 1,000 new paramecia were produced. The animals continued to reproduce after they had been removed from the tritium environment.

The second experiment, which also showed that the effect of tritium is comparable to that of other forms of radiation, was done by Dr. Austin M. Brues, Mrs. Agnes Stroud and Mrs. Leola Rietz. They injected tritium water into the abdominal cavities of young female mice.

Science News Letter, March 1, 1952

ZOOLOGY

Homing Instinct of Frogs

➤ FROGS MAY have more in the way of human instincts and characteristics than heretofore realized.

Illinois Natural History Survey biologists in Urbana have found some correlation between a well-developed homing instinct and size and sex of bullfrogs from a 10-year study made at 18-acre Ridge Lake, near Charleston, Ill. Frogs captured around the lake shore were marked and released at the Natural History Survey laboratory pier. More of the large than of the smaller-sized frogs returned to their original area of capture. Two-thirds of the frogs, all females, demonstrated a good homing instinct. Of four bullfrogs showing poor homing tendencies, three were males.

The approximate growth rate of the bullfrogs at Ridge Lake was determined from marked specimens, recaptured over the 10-year period. Most of them disappeared from the lake one or two years after they were marked, but one was recaptured after six years.

Adult frogs of the female sex were found to be usually larger than the males, indicating the possibility that the males do not normally reach as large sizes as the females.

Successive recaptures and measurements of some marked adult frogs revealed a decrease in total length after their original capture. In one specimen this decrease amounted to eight-tenths of an inch, a considerable amount considering the small size of frogs.

The study was designed to discover the environmental factors that increase or decrease the numbers of bullfrogs. The information has economic value and is of special interest to people who wish to indulge their liking for a popular food delicacy, frog legs.

Science News Letter, March 1, 1952

ENGINEERING

Quick Warm-Up Needed To Reduce Engine Wear

➤ AUTOMOBILES SHOULD be redesigned to have a short engine warm-up period to reduce excessive wear, in the opinion of C. C. Moore of the Union Oil Company of California.

A popular car recently studied required from 10 to 15 minutes of driving before the engine reached 150 degrees Fahrenheit, Mr. Moore reported to the Society of Automotive Engineers meeting in Chicago. It took 50 minutes of normal driving before the crankcase oil reached the same temperature.

Engine wear is greatest at low water-jacket temperatures—that is, when the engine is cold, H. R. Jackson, F. C. Burk, L. J. Test and A. T. Cowell, all of the Atlantic Refining Company, reported earlier from their studies using a radioactive-tracer technique.

Mr. Moore pointed out that 20 minutes often was "normal driving time" for many car owners. Where that is the case, it means the automobile engine is wearing excessively practically all of the time the car is in operation.

Mr. Moore said a short warm-up cooling system, in addition to helping to reduce engine deterioration, should also be adequate for continuous hot-weather and heavy-duty service.

Science News Letter, March 1, 1952

MEDICINE

ACTH Decreases Blood Flow Through Brain

➤ LESS BLOOD flows through the brain when patients are getting ACTH, famous anti-arthritis medicine from the pituitary gland.

The decrease in blood flow through the brain amounts to 18%, Drs. James F. Schieve, Peritz Scheinberg and William P. Wilson of Duke University School of Medicine, Durham, N. C., found.

The Duke scientists made their studies in the hope of learning why some patients have an increased sense of well-being when getting ACTH, and some even become mentally disturbed.

The studies did not give any information on these points, however.

Besides discovering the decreased brain blood flow during ACTH treatment, the scientists found that the brain's use of oxygen and sugar was not changed.

Science News Letter, March 1, 1952

GENERAL SCIENCE

Joint Labs to Serve All British Scientists

➤ JOINT LABORATORIES to conduct research in special fields for the whole British Commonwealth are being considered at the British Commonwealth Scientific Conference assembled in Canberra, Australia. This is the first time since 1946 that such a meeting has been held.

The country having the best facilities for an investigation would conduct it in some cases, while joint teams would be formed in other instances.

The use of seaweed, application of microbiology to industry, use of low-grade ores and wastes, wool, soil mechanics and the use of solar energy are among subjects to be discussed by the meeting which will continue until March 7. Other problems include: new insecticides, physiology in relation to climate, particularly in the tropics, grasslands, radioactive tracers, blood, tooth decay, and the difference between standards for physical growth in various countries and for different types of people.

Science News Letter, March 1, 1952

PUBLIC SAFETY

Revive War Gas Victims

Forced breathing method developed to provide treatment under combat conditions for troop casualties resulting from enemy gas attack.

➤ A MOUTH-TO-MOUTH forced breathing method sometimes used to revive choking babies has been modified by Army Chemical Corps scientists for use in saving war gas victims.

The forced breathing is done through a length of corrugated rubber tubing which is connected to the gas masks of both operator and victim.

According to the official report of the new device, it was developed specifically to provide treatment under combat conditions for troop casualties that might result from an enemy attack with gases. In such an attack, it is likely that a number of casualties would require artificial respiration, in addition to drug inoculations given to counteract the action of the poison. This task would be difficult because both the victim and his rescuer would have to be gas masked.

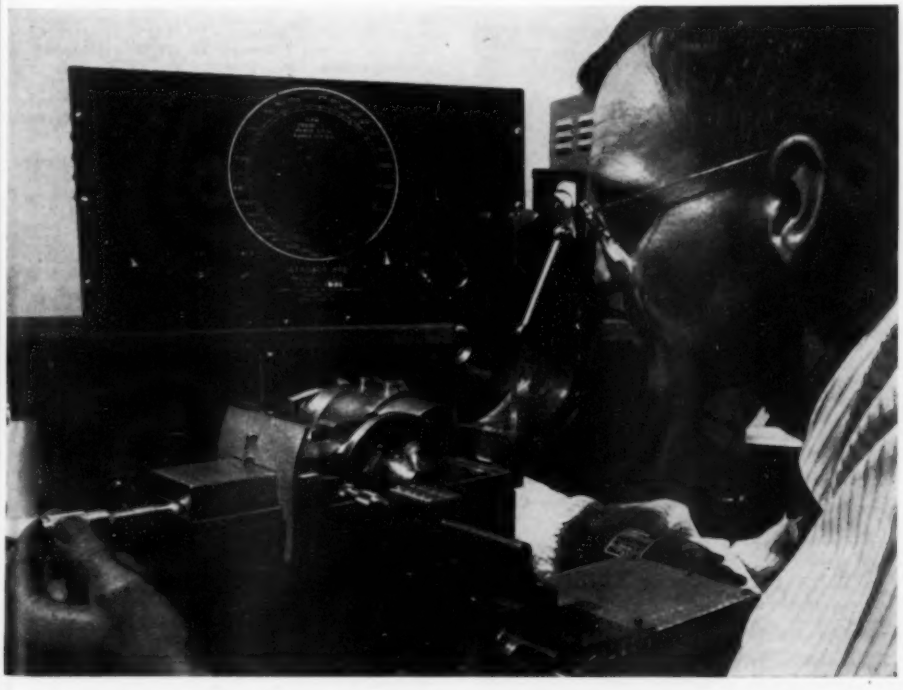
The operator inhales clean air through his own canister and by exhaling, forces it into the lungs of the victim. The victim exhales through a valve in the side of the tube. If the victim is unconscious and cannot breathe, himself, the contaminated air may be forced from his lungs by pressure on the lower ribs.

Tests at the Chemical Center at Edgewood, Md., show that the forced breathing is not unduly tiring on the operator and it has been carried on for more than an hour, although 20 minutes would normally be the maximum time required. It was also determined that the operator's lungs can exert enough pressure to overcome the constriction of the victim's windpipe that usually occurs in gas poisonings and which ordinary artificial respiration will not overcome.

Further tests show that the "second-hand" air breathed into the victim contains more than an adequate supply of oxygen and that the concentration of carbon dioxide is not injurious to the victim.

Developers of the resuscitator emphasize that it is not a substitute for normal artificial respiration. It was designed specifically for the treatment of gas victims in combat. As such, they said, it is not likely that the device will have any industrial application, except possibly in instances where both the victim and the rescuer must be gas masked.

Science News Letter, March 1, 1952



CUTTING WIND—Moving faster than the speed of sound, a cutting wind is used to slice extremely thin sections by Dr. E. F. Fullam, of the General Electric Research Laboratory, who designed the instrument known as a high speed microtome.

ASTRONOMY

Star Varies in Brightness Every 80 Minutes

➤ A STAR that every 80 minutes shines brightly, then becomes dim only to brighten up again, has been discovered in the southern constellation of the Phoenix. This is the shortest period known for a variable star.

Often the star doubles its brightness within ten minutes, report Drs. Olin J. Eggen and Gerald E. Kron, astronomers of the Lick Observatory of the University of California, now working at the Commonwealth Observatory, Canberra, Australia.

Science News Letter, March 1, 1952

TECHNOLOGY

Air Used as Cutting Edge Of "Supersonic Knife"

➤ AIR IS now being used to cut everything from asbestos to zinc in a General Electric Research Laboratory at Schenectady, N. Y.

The air is compressed by a small knife blade which whirls at supersonic speeds on a wheel. Dr. E. F. Fullam, who uses the instrument, said he believed air does the actual cutting rather than the knife because he had noticed the blade did not become dull with use.

Called a high-speed microtome, the machine revolves the knife blade 65,000 times a minute, reaching a knife-blade velocity of 818 miles an hour, about 68 miles an hour faster than the speed of sound. Sections of metal less than two-millionths of an inch thick can be cut by the compressed air. A smooth surface is left on the face of the cut.

The invisible-to-the-naked-eye sections are then studied under a powerful electron microscope which magnifies 25,000 times.

Size and sharpness of knife blades have no effect on the cutting properties of the microtome except as to their abilities to compress an "edge" of air. Small, almost invisible wires have even been used by Dr. Fullam in previous microtomes. His latest model, however, employs specially built knife blades.

The machine is capable of slicing specimens of most materials about as round as a pencil. Rubber and vitallium resist cutting. Dr. Fullam said rubber could be cut if it first was frozen in liquid nitrogen or vulcanized to a more brittle state. Vitallium, one of the hardest of metals, could be cut, he said, if higher knife-blade speeds could be obtained to compress the air to a greater extent.

Science News Letter, March 1, 1952

MEDICINE

New TB Drugs On Trial

➤ TUBERCULOSIS PATIENTS and their relatives will have to wait several months before doctors can tell them the real value of the latest drugs as promising tuberculosis remedies.

Time is needed, according to one authority, to run animal cultures on material from tuberculosis patients getting the new drugs. Such cultures may take from six to 12 weeks.

Return of temperatures to normal, weight gain and a feeling of well-being are not considered sufficient evidence that a new drug has arrested or "cured" the disease in a patient. Counts of TB germs in the patient's sputum are not considered sufficient evidence either, because these may vary considerably from day to day even in patients not getting the new drug.

Three new drugs with four different names are currently heralded as promising much in the fight against the great white plague. One is a pyrazine chemical related to nicotinic acid, or niacin, which is one of the B vitamins. This chemical is made by Lederle Laboratories under the name, Aldinamide. Successful use of it was announced at a Veterans Administration conference in St. Louis in January as reported by SCIENCE SERVICE.

The second new TB remedy is isonicotinic acid hydrazide. This is marketed by Squibb and Co. as Nydrazid and by Hoffman-La Roche as Rimifon.

The third drug, called Marsilid, is the isopropyl derivative of Rimifon. All three chemicals, with four names, are somewhat related. They are being tried in Veterans Administration and other hospitals, with reports varying from cautious to enthusiastic.

The drugs can be given by mouth, which gives them one advantage over streptomycin. TB germs may build up resistance to the new drugs, as they do streptomycin, but in that case it is believed other, related chemicals could be made and used.

Science News Letter, March 1, 1952

TECHNOLOGY

Better Windshield Safety

➤ JUST AS cracked windshields annoy automobile drivers and make driving hazardous, so they worry airplane pilots and make flying dangerous.

But pilots are more concerned about their windshields than the average driver. Airplane windshields often crack because of cold temperatures and faulty windshield deicing systems which the driver does not have to worry about.

Research now has overcome most of the trouble, the Boeing Airplane Co. announced. Scientists found windshields cracked because of "hot spots."

Hot spots were caused by uneven applications of a 20-millionths-of-an-inch-thick layer of electricity-carrying stannic oxide which is sandwiched between the two plates of glass forming the windshield.

Research workers searched for a way to measure the stannic oxide thickness to discover hot spots before they could sabotage windshields. A quick thickness-testing method was developed.

Windshields also cracked because they got too hot. Boeing research workers licked that problem by rigging a device into the plane which cuts the electricity flowing through the windshield when the glass gets too warm. The device also increases the current if ice begins to form.

Electrically heated windshields are being supplied by Boeing on its B-47 Stratojet bombers and C-97 Stratofighters.

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The supply of *aluminum* in 1951 fell far short of the demand even though the production of primary aluminum increased throughout the year and the recovery of aluminum from scrap was 26,000 tons more than in 1950.

Question Box

ASTRONOMY

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BIOCHEMISTRY

What new class of chemicals is anti-malarial in action? p. 136.

ELECTRONICS

What is a transistor? p. 138.

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How can shock after injury be prevented? p. 137.

TECHNOLOGY

How do picture drawings speed airplane production? p. 134.

WILDLIFE

What is the most important news about whooping cranes? p. 140.

Photographs: Cover, California Academy of Sciences; p. 131 and 135, General Electric Company; p. 133, Boeing Airplane Company; p. 138, Bell Telephone Laboratories.

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GENERAL SCIENCE

Hybrid Yeast Forms

Other Science Talent Search winners study soilless gardening, flat wall paints, learning rate of hamsters and luminescent glazes.

Talented youngsters from high schools throughout the nation are now in Washington for the Eleventh Annual Science Talent Institute, competing for top scholarship awards. For other reports of their achievements for which they were awarded a five-day trip to the nation's capital, see SNL, Feb. 23.

Tries to Hybridize Yeast

➤ AN INVESTIGATION into methods of producing hybrid forms of yeast was the scientific project of Wilma P. Laufer, 17, one of the top winners in this year's Science Talent Search.

Yeast, the Forest Hills (N. Y.) High School senior explained, is very difficult to hybridize. Some types are not capable of being hybridized. She worked with three types of lager yeast and two types of ale yeast.

She tried several methods of producing spores from the five different yeasts. Sporulation, she explained, is necessary to hybridization.

By only one method was a fair amount of spores obtained in all the yeasts. She concluded that the lager yeast differs from the ale yeast, in such ways as to indicate that some forms of the lager yeast have lost their ability to form spores.

Plants Without Soil

➤ PLANTS GROWN without soil can withstand transplanting better because they are able to produce better-developed root systems than do plants grown the old-fashioned way.

This is the conclusion of Mary B. Boat, 18, who has studied the soilless growth of radish seedlings.

The Poughkeepsie (N. Y.) High School senior divided her radish seeds into four groups. Three were raised by soilless culture, the fourth, a control group, was sown in soil.

Miss Boat kept records of the time of germination of the different groups of seeds, of the average heights of the seedlings, of the root development and the leaf color.

She found indications that soilless culture produced earlier germination, probably because less weight was bearing down on the seeds and more oxygen was able to get to them. Damping off, she said, was virtually eliminated in the three groups grown without soil.

The readily available food in the nutrient solution on which the soilless plants grew and the ease with which roots can grow in pure sand, vermiculite or water promote a compact root system, she pointed out, which makes for easier transplanting.

Constructs Counter

➤ EXPERIMENTATION with radioactivity was the scientific project of 17-year-old David Y. Smith, a Mont Pleasant (Schenectady, N. Y.) High School senior. He first became interested in radioactivity when, as president of his science club, he had to answer questions of the other members.

He constructed his own Geiger counter and then went about his home, listening for radioactivity. Outside of an occasional cosmic ray, all he found to activate his Geiger counter were the luminous paint on an old watch dial and the luminous end of an electric light chain.

So he bought some radiactive carnotite. With this he carried out two systematic experiments: The relation of radiation intensity as a function of the distance from the source, and the relation of the absorbing power of the metal as a function of the thickness.

He plotted both experimental and theoretical curves on graphs to demonstrate these relationships.

Tests Wall Paints

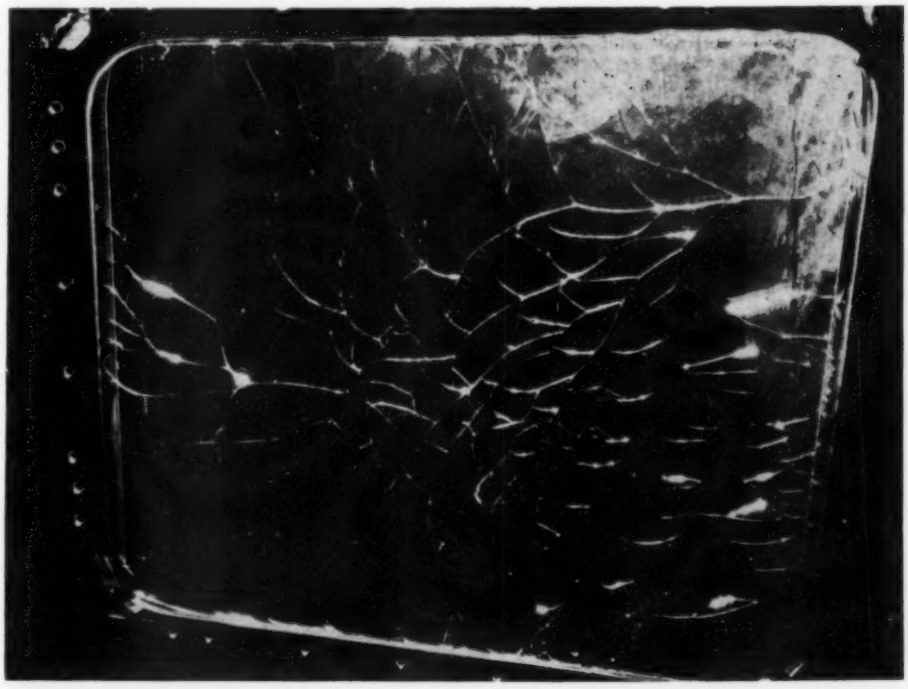
➤ RALPH E. GRISWOLD, 17, tested three kinds of flat wall paint to find out how they compared in durability, looks, resistance to water and other qualities.

The young scientist built several of his own instruments to make the tests. The three paints he tested were a standard oil-base flat wall paint, a latex-resin emulsion flat wall paint and a resin emulsion flat wall paint.

The Northside (Atlanta, Ga.) High School senior found that the standard oil-base paint had good brushing qualities and satisfactory hiding power. It took 23 hours to dry as compared with four and three hours for the latex-resin paint and the resin paint, respectively.

The resin paint, which is sold as a paste and is mixed with water, applies easily and demonstrates outstanding hiding power, the young scientist said. However, the surface qualities of the paint were unsatisfactory, he found.

The latex-resin paint, he reported, resisted soiling better than the other two, but



CRACKED WINDSHIELD—Uneven temperature distribution caused this electrically-heated windshield panel to fail during test flight on a Boeing C-97 Stratofreighter. Windshields have now been improved to eliminate this defect. (See opposite page.)

the standard oil-base paint was more resistant to water than the others.

Hormone Injections

➤ ROOSTERS STOP crowing, their tail feathers droop and their combs wither away when they are injected with female hormones. Their meat seems to be more tender when they are killed and eaten.

Sixteen-year-old Charlotte A. Eddings, found this out in experiments with four young roosters. Two of the roosters were injected under the skin of the neck with pellets containing 12 milligrams each of the female hormone. The other two were used as controls.

Hardly two weeks after the injection the "caponettes" had lost the liveliness common to the roosters used as controls. Eight weeks after injections, the effect was beginning to wear off and soon one made his first feeble attempt to crow.

There was little difference in weight from week to week between the caponettes and the controls. However, the young North Phoenix (Phoenix, Ariz.) High School senior said, this might not prove out with a large group of roosters.

The final act of the experiment was to kill one of the caponettes and eat it. Miss Eddings reports that its meat seemed to be more tender than ordinary rooster meat.

Hamsters' Memories

➤ MALE HAMSTERS can learn about as fast as female hamsters, but females forget more. These are the tentative conclusions of 15-year-old John R. Seaman, an Oceanside (N. Y.) High School senior who took four Syrian golden hamsters, two male and two female, and put them through a four-by-six foot maze. Food was in the middle and the hamsters had to learn the maze to reach the food.

On each successive "lesson" the hamsters, both male and female, cut their time down at about the same rate, with the males, perhaps, being a little quicker than the females.

The animals completed 15 trials between May 2 and June 13 last year, cutting their time down from an original average of 551 seconds to 70 seconds.

After that they were given a rest during summer vacation and in September the young scientist tried them out again to see how their memories were. In the first four trials in the fall, the males averaged 99 seconds, the females 129 seconds.

Glowing Tiles

➤ TILES WHICH glow, under the proper activation, made from natural materials, were the subject of 17-year-old H. Rodney Hartmann's scientific project.

The New Brunswick (N. J.) High School senior attempted to make a luminescent glaze out of natural phosphors he found in the surrounding countryside. He baked his experimental glazes in a ceramic oven at Rutgers University.

His conclusions were that such glazes are still in the experimental stages and need much work. He found that the luminescence seemed to vary inversely with the quality of the glaze—a glaze with superior covering quality seemed to glow with a lower intensity of the phosphor.

The young scientist pointed to a wide range of uses for his luminescent glazes, if perfected. These include, he said, a variety of decorative purposes, particularly in the form of mosaics. Also, they might be used in producing warning and directional signs, provided a cheap source of activation could be developed.

Plankton Movements

➤ ZOOPLANKTON—tiny organisms on which fish feed—do not all move up and down in lakes in the same way or at the same time. Russell Noyes, Jr., 17, discovered this in a survey of the vertical migrations of zooplankton.

As a rule, he pointed out, plankton migrate toward the surface at dusk and back toward the depths at dawn. In surveying the various kinds in five Indiana lakes, the young scientist found considerable variations in this general rule.

The University (Bloomington, Ind.) High School student found many factors affecting the way in which the various kinds of plankton migrate. Among these are the temperature of the water, dissolved gases, food, gravity, wind and the age of individual plankton.

One kind actually rises toward the light at dawn. Others do not seem to migrate at all, he found.

Caponized Fowl

➤ ROOSTERS TREATED with female hormones to make their meat tender and to increase their weight may have some effects on human beings if they eat enough of the meat.

This is the conclusion of 17-year-old Karl H. Muench, Evanston Township High School senior, Evanston, Ill., who fed stewed chicken caponized with chemicals to 24 golden hamsters.

It is a wide-spread practice, he pointed out, to put a pellet of female hormone under the skin of a rooster, near the head. Eating this pellet would be dangerous. However, the question still remains whether the rooster absorbs enough of the female hormone through the edible portions of the body to make the meat harmful to human beings.

"The evidence seems to favor the fact," said Mr. Muench, "that chemically sterilized roosters contain appreciable amounts of stilbestrol in their edible portions."

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● RADIO

Saturday, March 8, 1952, 3:15-3:30 p.m. EST

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Alan Waterman, director of the National Science Foundation, discusses the "National Science Foundation."

ZOOLOGY

Antipodes Chelonians Arrive in California

See Front Cover

➤ TWO INOFFENSIVE plodders have arrived at the California Academy of Sciences.

The half-way-around-the-world travellers are registered officially as *Chelodina longicollis*. They poked five inches of necks out from under their six-inch carapaces for their first look at the U. S. They are rare, long-necked turtles found in rivers and streams of southern Australia.

The bright, yellow-eyed pair, now weighing about five pounds each, may eventually weigh nine pounds. They can grow to 14 inches with ten-inch necks.

Dr. Joseph Slevin, curator of herpetology, noted that long-necked turtles lay eggs in the dirt, scooping out nests by rapidly turning round and round, throwing out the sand or earth with their feet. Egg-laying time, 20 eggs to a setting, Dr. Slevin says, is in November. The young appear in February or March. Omnivorous in habits, they eat meat, fish, and vegetables.

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TECHNOLOGY

"Picture Drawings" Speed Production for Boeing

➤ ISOMETRIC DRAWINGS—which look like pictures but which have much of the accuracy of blueprints—are being employed by the Boeing Airplane Company along its B-47 medium-bomber assembly line in Seattle.

Company officials said the isometric drawings also were to be used when the company begins producing B-52 Stratofortresses, a heavy bomber.

The isometric drawings eliminate the necessity of a workman consulting several blueprints before he drills a hole. Shown in picture form, the design is so clear that even a "green hand" can see at a glance exactly where the hole is to be drilled.

For wiring and tubing illustrations, technical illustrators go inside an airplane which has been built and sketch the wiring and tubing runs against the background of the plane's interior. These drawings have cut installation time in half, the officials said.

The isometric technique was tried first during World War II in Boeing's Wichita plant.

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RADIO ASTRONOMY

Seek Noisy Radio Stars

Giant radio telescope, 160 feet long and 12 feet wide, being built as "ears" for astronomers to record hissing signals of radio stars.

➤ A SEARCH for radio stars, those peculiar stars whose cosmic hisses can be picked up on earth, will soon begin at Ohio State University, Columbus, Ohio. A radio telescope 160 feet long and 12 feet across is being constructed to record their noisy signals.

The telescope, to be one of the largest in existence and the only one of its particular design, is being built under the direction of Prof. John D. Kraus. The instrument will use spirally wound antennas which Prof. Kraus invented. It will operate on the ultra-high frequency of 250 megacycles.

The completed instrument will consist of an array of 48 helical beam antennas arranged in eight units and mounted on a long, movable steel cradle. The new radio telescope will be put into operation in March, just as soon as two units are completed. As the antenna size is increased through the addition of units, it will reach farther out into space and do a better job of separating radio waves that come from stars located close together in the sky.

Radio telescopes are an astronomer's "ears" just as optical telescopes are his "eyes." Radio telescopes have to be larger than optical telescopes, the largest of which is not quite 17 feet across, because radio waves are so much longer in wavelength than visible light.

While the new radio telescope searches for stars and clusters of stars that broadcast cosmic static to the earth, the university's optical telescopes will be turned on the same area of the heavens and the work of the two types of telescopes coordinated. To date over a hundred stars are known to be hissing at the solar system, but astronomers still are not sure just what they look like. Some day the stars responsible for this "frying" sound may be located exactly through this and similar surveys.

Only one other American university, Cornell, today is active in the field of radio astronomy. Cornell has two installations, one at Ithaca, N. Y., and the other at Sacramento Peak, N. Mex. Here particularly interesting research is being conducted on the sun.

The Naval Research Laboratory in Washington, D. C., boasts of one of the world's most versatile radio telescopes. Its basket-shaped instrument is 50 feet across. The instrument was designed to pick up super high frequency signals of 1,000 megacycles. The National Bureau of Standards, with its instruments at Sterling, Va., was one of the first groups to enter the field of radio astronomy.

In all there are only several dozen radio telescopes in the world. Besides the United States, they are to be found in England, Australia, France, Canada and the Netherlands. The world's largest, over 200 feet across, belongs to the University of Manchester in England. A few, on the other hand, are so small they are easily portable.

Science News Letter, March 1, 1952

TECHNOLOGY

Roll and Slice Method Cuts Jet Engine Cost

➤ MORE THAN half of the 2,000 tiny compressor blades that are at the "heart" of the jet airplane engine in the Boeing B-47 Stratojet can now be made by a new, much cheaper process, the General Electric Company reported in Lynn, Mass.

Previously all of the blades and the bases in which they are fixed have had to be hammered from a single piece of stainless steel. Each of the blades resembles an airplane wing, and its air foil shape must be exact. Using the new process, the blades are rolled in long strips, contoured to the proper air foil shape, and cut to the desired length during assembly.

The tiny blades are used in the compressor, the device which forces air in great quantities to the combustion chambers of jet engines. It consists of a rotor and a stator, both of which have hundreds of blades. As the rotor turns, air is forced through the rotor and stator blades and compressed as it travels to the rear toward the combustion chambers. The fabricated blades can be used only for the stationary blades. The rotary blades will continue to be forged because of the high centrifugal stresses involved.

Science News Letter, March 1, 1952

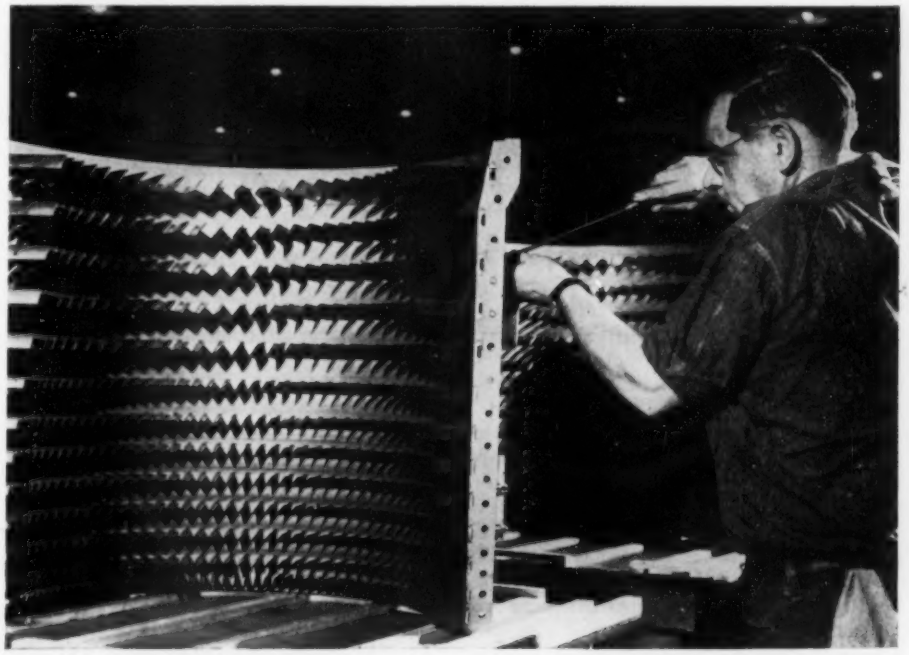
INVENTION

Metal Pony Invented For Rides on Papa's Knee

➤ "HERE WE go riding to Banbury Cross." That old nursery rhyme, sung while "riding" children on a parent's knee, will take on much more realism as the result of an invention which has received a patent.

It is a knee pony. The inventor is Kenneth E. Sickelbower, Russell, Kans., who received patent number 2,585,279. The pony is made of a sheet material that is flexible. The material is cut, creased and folded to represent the pony—and then it is ready for perching on the parent's knee.

Science News Letter, March 1, 1952



STATOR BLADES—This is the compressor stator of a General Electric J-47 jet engine. Use of fabricated stator blades, and each stator has hundreds of blades, will eliminate a potential bottleneck in jet airplane production.

HORTICULTURE

Outdoor Artificial Light Speeds Asters' Blooming

➤ GREENHOUSEMEN KNOW that indoor lighting can speed the blossoming of China asters and make the flowers larger.

Experiments conducted by Dr. Anton M. Kofranek, instructor in floriculture at the University of California at Los Angeles, have proved that outdoor artificial lighting has a similar effect.

Normally, China asters in southern California bloom from the middle of May through the summer. By providing artificial light in the outdoor gardens, Dr. Kofranek made the asters start blooming in March, produced flowers one to two inches larger than normal and found less disease.

"Lighting asters for early bloom is by no means a new practice," Dr. Kofranek said. "It is frequently done by eastern growers in greenhouses during the winter and spring months.

"The unique feature of this experiment is that it was performed outdoors where night temperatures cannot be controlled. Local conditions vary so greatly in California, however, that it is not possible to give accurate recommendations from the evidence obtained."

Science News Letter, March 1, 1952

PUBLIC HEALTH

Try Upright Cleaning To Save Your Energy

➤ IN SPITE of modern labor-saving devices for the home, housewives spend considerable energy in the reaching, bending, stooping and twisting of such every day jobs as preparing food, washing dishes, storing utensils and supplies, making beds, cleaning and laundering.

A study of this has recently been made by Dr. Esther Bratton of the New York State (Cornell) Experiment Station. Commenting on her findings, Dr. Bratton says: "Women generally do not realize how much they are lifting when they pick up a small object from the floor or take a small pan from the bottom shelf of a cupboard. The energy cost of lifting the small object is not much, but that of lifting a large proportion of the body is considerable."

Movements where only the arms are used take less energy than stooping plus using the arms, Dr. Bratton found. But even in arm movements, a reach of as little as 10 inches from one level to another called for considerably more energy.

Women can save some energy, home economists of the U. S. Department of Agriculture point out, by using cleaning tools and cleaning utensils that have long handles. The handles should be long enough for comfortable, fast work in the upright position.

Many women bend almost double at the daily chore of cleaning the bathtub with a cloth when they could save strain and a possible accident by using a long-handled brush. For easiest sweeping, homemakers could take a tip from industry and use a long-handled push-broom with fine bristles and a long-handled dustpan. Many could make better use of vacuum cleaner attachments.

If handles of brooms, mops and even vacuum cleaners are too short for comfort, as they may be for taller women, it's worth having the household handyman add a length or even install a longer handle to make work easier and faster.

For waxing floors, the specialists advise a long-handled applicator and self-polishing wax to save effort. Those who use "wet mops" need to consider not only the length of the handle but the weight of the mop when lifted out of water. The new light sponge mops may do the job more easily than the more familiar "rag mop."

Science News Letter, March 1, 1952

BIOCHEMISTRY

Deadly Peruvian Disease Conquered by Mold Remedy

➤ A DISEASE of the high Andes in Peru, which kills from a third to half its victims, now shows signs of being conquered by chloromycetin, one of the famous so-called mold remedies.

Swift "cures" of the disease in six patients are reported by Dr. Oscar Urteaga of the Hospital Dos de Mayo in Lima, Peru, and Dr. Eugene H. Payne of Parke, Davis and Company, Detroit, who manufacture both the mold-produced and synthetic chloromycetin.

The disease is named Carrion's disease for Daniel Alcides Carrion, a Lima medical student who intentionally infected himself with it and died. It is caused by a germ spread by sandflies found only in high valleys and caves of the Andes mountains. The sandflies seem to bite only at night, and the natives warn visitors to leave the valleys by nightfall.

In its grave form, known as Oroya fever, it is marked by headaches, fever of 101 to 102 degrees Fahrenheit, sometimes higher, and anemia which is often fatal. One fourth of the Spanish soldiers who conquered Peru under Francisco Pizarro are believed to have been killed by the disease. An outbreak in 1874 killed 7,000 workmen and halted construction of the railroad up Rimac canyon from Lima. The malady is especially deadly when complicated by an additional infection of typhoid-like bacteria.

A second form, Verruga Peruana or "Peruvian wart," is less serious but extensively disfiguring. Until Carrion inoculated himself with blood from one of the warts in 1885 and died of Oroya fever, the two forms were believed to be different diseases.

Drs. Urteaga and Payne report their results in ANTIBIOTICS AND CHEMOTHERAPY.

Science News Letter, March 1, 1952

IN SCIEN

AERONAUTICS

Electronic Altimeters For Higher Flights

➤ TWO ELECTRONIC altimeters designed to measure altitudes as high as 95 miles are currently undergoing tests at the National Bureau of Standards, the U. S. Air Force announced.

The altimeters were developed in anticipation of greater heights at which aircraft will be flying sometime in the future. Present aneroid-type altimeters used by the Air Force measure heights up to 30 miles, but require a special kind of magnifying system when altitudes exceed 16 miles. That is because air-pressure changes are small at that altitude for corresponding changes in height.

One of the new altimeters generates heat in a glass tube. The heat is transmitted by the surrounding air to a heat-sensitive element in the tube. The amount of heat transmitted is proportional to the altitude. Electrical currents generated by the process are then translated into feet of altitude for the pilot to read on a dial. That altimeter is to operate between 150,000 and 300,000 feet.

The other altimeter emits electrons from its filament which bombard a positively charged wire called a grid. That process generates positively charged ions which are attracted to a negative element in the tube called a plate. The ratio of plate current to grid current is proportional to altitude. The new device is designed to operate between 300,000 and 500,000 feet.

Science News Letter, March 1, 1952

BIOCHEMISTRY

New Chemicals Have Anti-Malaria Effect

➤ SEARCH FOR anti-cancer chemicals has led to creation of a new class of chemical compounds with anti-vitamin and anti-malaria activity.

The new chemicals are called dihydrotriazines. They were synthesized by Edward J. Modest, working in a team with George E. Foley, Maurice M. Pechet and Dr. Sidney Farber of Children's Cancer Research Foundation and Harvard Medical School, Boston.

One of the new compounds is about six times as active as quinine and twice as active as atabrine in stopping malaria in tests with ducks.

Details of the synthesis of the new chemicals are reported to the JOURNAL OF THE AMERICAN CHEMICAL SOCIETY (Feb. 5).

Science News Letter, March 1, 1952

ENE FIELDS

MEDICINE

For Shock After Injury, Keep Wound Cool With Ice

➤ TO PREVENT shock after injury, use ice or other means to cool the injured area.

This seems likely to become the future direction to first aiders and others handling wounded persons if further research bears out experiments by Drs. Dan H. Moore and Douglas L. Worf at the electrophoresis laboratory of Columbia University College of Physicians and Surgeons in New York.

The cooling prevents loss of fluid from the blood circulation into the injured part, their experiments showed. This fluid loss, of course, causes a decrease in the volume of blood circulating through the body. Transfusions of blood plasma, serum albumin or the new "plasma-extenders" are given to fight shock by restoring the volume of circulating blood and checking any further loss of fluid into the injured tissues.

The cooling treatment would, it appears, prevent shock by slowing the damage to blood vessel walls that allows the fluid to escape. This damage, called autolysis, is a kind of self-destruction or digestion of tissues.

Science News Letter, March 1, 1952

MEDICINE

Self-Check for Hearing Loss

➤ IF YOUR friends joke with you about not paying attention or not hearing well, maybe it is a sign that you are losing your hearing.

Loss of hearing is no joke. When friends or relatives start joking with you about not paying attention or not hearing well, take the friendly joke as a warning to see your doctor at once, so that you can protect the hearing you have left.

Maybe no one has dared to joke with you about not hearing well. There are other signs you can check yourself on. The American Hearing Society gives the following:

Do I frequently ask that words or phrases be repeated?

Can I hear conversation as easily as some one with normal hearing?

Can I hear a dripping faucet in the room with me?

Can I hear with my back turned to the speaker?

Do I strain to hear, or habitually turn one ear toward the speaker?

If the result of this self-check shows your hearing is not up to par, you should see your doctor, who will probably send you to an ear specialist. Then your hearing will be tested by an audiometer, which is a machine for measuring hearing. From the results of this test, the doctor can advise you on whether you need a hearing aid, what type you need, and other measures for protecting and improving your ability to hear.

Even if you think your hearing is excellent, an audiometer test at regular intervals is advised by the American Hearing Society, because loss of hearing may come almost without warning.

For protecting good hearing, the society advises the following:

Keep ears clean without using match sticks, or paper matches, metal objects, or harsh materials. (Let your ear doctor clean out accumulated wax.)

At the first sign of ear pain, or discharge, see your doctor! (Many cases of hearing loss can be prevented if infection is caught early and properly treated.)

Avoid swimming in uninspected pools or stagnant waters. (Ear infection can start from water remaining in the ear.)

Avoid violent blowing of the nose. (This may lead to infection in the middle ear.)

Science News Letter, March 1, 1952

TECHNOLOGY

Student-Made Jet Engine Is Small, Powerful, Fast

➤ STUDENTS AT Northrop Aeronautical Institute, Hawthorne, Calif., have developed a miniature jet engine which eventually may find its way into small private-type airplanes.

Known by its copyrighted name "Centriflow," the engine is an outgrowth of past student-built jet engines. Its overall diameter is 26 inches and its length is 67.4 inches. It weighs 172.4 pounds, consumes 26 gallons an hour of 80-octane aviation gasoline and is capable of powering a small plane at 300 miles an hour.

Extensive ground tests are being administered to the miniature jet engine. Northrop students plan to try the engine in a Ryan Navion after ground tests have been completed.

Science News Letter, March 1, 1952

INVENTION

Turboprop Exhaust System For Waste Gas Elimination

➤ WHEN TURBOPROP engines are used to run pusher-type propellers what to do with the exhaust gases becomes a problem. Julius Jonas, Los Angeles, Calif., has invented a method of getting rid of the gases without sending them through the propeller blades and without the need for constructing a cumbersome, bending leadaway pipe.

He has assigned his patent, numbered 2,586,054, to Northrop Aircraft, Inc., Hawthorne, Calif.

Science News Letter, March 1, 1952

INVENTION

New Runway and Beacon Lights to Aid Pilots

➤ A HIGH intensity airport runway marker light, which will be of use to the pilot under most very poor visibility conditions, and a low-cost, more reliable airport beacon designed for use at smaller airports were patented recently.

They were invented by Willis A. Pennow, Cleveland, and assigned to the Westinghouse Electric Corporation, East Pittsburgh, Pa. They received patent numbers 2,586,374 and 2,586,375.

Candle power up to 100,000, as contrasted with the standard light, can be put out by the new high intensity runway marker light, the inventor claims. Furthermore, the intensity of the light may be controlled for use under different weather and visibility conditions. The marker light has several optical systems so that different light signals, as well as different degrees of intensity may be produced. In good weather conditions, the light may be used as are the standard marker lights.

The rotating airport beacon which Mr. Pennow invented, has a duplicate light which automatically turns on whenever the main light goes out. It also can be constantly seen by the approaching pilot as it rotates, rather than being only intermittently seen. The inventor claims that this is a simple, inexpensive beacon, which can be installed at most small private airports hitherto unable to afford a rotating light.

Science News Letter, March 1, 1952

MEDICINE

Germs Hide Out in Brain To Cause Disease Relapses

➤ A GERM hide-out in the brain or other parts of the body may be the reason patients with brucellosis, relapsing fever and other chronic diseases relapse after apparent cures by penicillin or other modern drug treatments.

In the case of relapsing fever germs, such a germ hide-out has been found in the brain. This discovery was made by Dr. Vernon T. Schuhardt of the University of Texas, Austin.

When the germs go into hiding, penicillin or other antibiotic drugs cannot reach them, he explains. When the medicine's effects wear off, the germs come out of hiding and start another siege for the patient.

Relapsing fever is not much of a problem in this country, though it causes much suffering in Africa and the Middle East.

The germ hide-out discovery, however, encourages Dr. Schuhardt to search for other hide-outs in other relapsing diseases with the hope of finding a way to cure them permanently.

Science News Letter, March 1, 1952

RADIO

Baby Rival to Vacuum Tube

A powerful midget of a device, made of a strange metal, can supplant the familiar electron tube. Transistors have military applications and help switch telephone calls.

By WATSON DAVIS

▶ TO OUR electronic age of radio, television, radar and a thousand other electrical applications, the familiar electron or vacuum tube is its heart. Millions upon millions of tubes are in use. Just look inside your radio.

Yet the vacuum tube has its first serious rival, a mite of a device without vacuum, glass, or lighted filament.

It is called the transistor. It is only a little over three years old, but it is already doing jobs for communication and the military that the tubes cannot do. It looks like a little cartridge and it does not even get hot in operation.

The essential stuff of this new wonder in electronics is a metal that almost no one knew about—germanium. And when the scientists who made it try to explain the transistor they talk about not only electrons but "holes" where the electrons have been driven out. Since electrons, which are the particles that make up electricity, are difficult to visualize, the holes that are where they were may defy imagination.

Has Corresponding Parts

What makes the tubes of a radio work does not seem so much of a mystery now. Thousands work with them every day. The transistor can be understood by comparing it with the continuously regulating electron valve which has made modern electronics possible.

The new electronic valve has what corresponds to hot lighted cathode, grid and plate (you can see these in a tube in your radio amplifier) all in a tiny bit of the metal germanium.

To the old-timers in radio who can remember back to the crystal set days, the transistor in one form will remind them of the crystal detectors with their cat whisker contacts. For the transistor first made has two cat whiskers, one input or emitter and the other collector or output. A connection to the base of the germanium crystal makes the triode, analogous to the familiar three-element electron tube. An even newer transistor does away with the whisker connections and leads are permanently attached to a bit of the metal and sealed in plastic.

What the transistor can do is important. Not only are they very small in size, but they operate on very little current. The latest junction transistor can be operated on about a millionth of a watt, which is pleasing to the telephone people, who are making first use of it, because a signal in a modern telephone takes about a millionth of a watt.

When a vacuum tube is used to amplify this millionth of a watt telephone signal, a full watt of current is consumed. This is like sending a freight train to deliver a pound of butter.

The first practical civilian job of the transistor is in helping to make it possible for you to dial any telephone anywhere in the nation from your own telephone. A bank of transistors will be used in an automatic device that will tell the telephone system's switching equipment how to route the call you are making over the toll lines between cities.

Fundamental Research Result

This amazing little transistor device came into existence because of a discovery that was made during fundamental research into the electrical properties of solids. The scientists were studying what they call semiconductors, that is materials that take on the properties of both metals and insulators depending upon the way in which they are treated.

Silicon and tellurium, which are metallic chemical elements related to germanium, have similar properties. They, too, may find use in even more advanced electronic devices of the future.

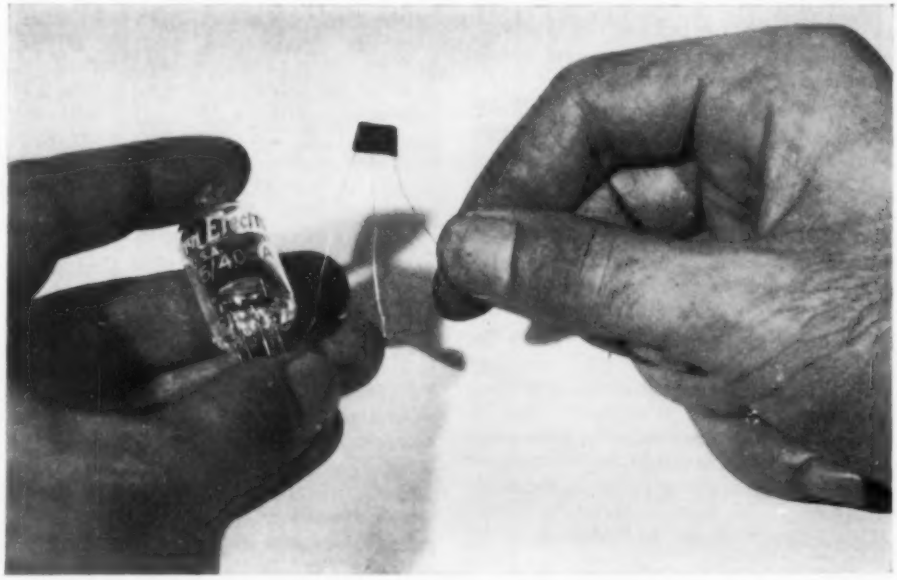
The principle of the transistor was discovered by the Bell Telephone Laboratories scientists, Drs. J. Bardeen, W. H. Brattain and William Shockley. They were studying the resistances of thin semiconductor layers when electric fields were applied to them. Drs. Bardeen and Brattain discovered that two contacts on the semiconductor surfaces and a connection to the crystal itself resulted in the arrangement being an amplifier. It acted very much like the highly useful triode vacuum tube.

Many New Uses

Many things are possible with transistors that the conventional vacuum tubes cannot do. Their small size and low power requirements will allow them to be applied to controls, such as in telephone systems, computors and unmentionable military devices. Transistors will be used first for tasks that they alone can do effectively. Then, in a few years, they will begin to invade more conventional fields of electronics, such as radio and television.

About 20,000 or so transistors, mostly of the contact or Type A sort, are being made each month. They are going into commercial telephone switching service. The junction type, which is smaller and eventually may be simpler and cheaper, is still in the developmental stage.

The experts are frankly quietly excited about the future applications, but they also



MIDGET DEVICE—The transistor at the right can do the job of the larger electron tube (left). This model, made of germanium, is called a junction transistor, second and latest sort to be developed by Bell Telephone Laboratories.

recognize that they have much to learn about how this new device works and the possibilities that lie in the metal of which it is made.

Germanium is one of the purest of metals as it is used in these new electronic devices. There is not much of it available, as it has been a by-product of recovery of cadmium and zinc. It costs from $100 to $200 a pound.

Also Rectifies Current

Another property of germanium is that of rectifying electric current, that is, changing alternating to direct current. In this, processed germanium metal operates more efficiently than existing rectifiers of selenium and copper oxide. The General Electric Co. rates the germanium rectifier, made in a form not much larger than a thimble, as perhaps the best rectifying metal yet discovered.

When the transistors as they are developed in the future are combined with the printed wire circuits that replace wires with streaks of metallic ink or paint, the electronic devices of the future will be smaller and probably cheaper. With transistors, a two-stage amplifier can be fitted into a match box. The dream radios of fiction may not be too far in the future.

Science News Letter, March 1, 1952

MEDICINE

New Stomach Juice Test May Aid Cancer Diagnosis

➤ FINDINGS THAT may lead to a new aid for diagnosing cancer of the stomach are reported by three cancer researchers, Dr. Shields Warren of New England Deaconess Hospital and D. Rourke Gilligan, biochemist, and J. Rothwell Moor, research technician, of the Harvard Cancer Commission.

Cancer patients these researchers find, have in their stomach juices more free and peptide amino acids than normal persons or patients with ulcers.

The ulcer patients had the same amount and kind of amino acids as the normal persons. The amino acids are the building blocks of protein. The amounts and kinds in the stomach juices of the patients and normal persons after fasting were determined by paper-partition chromatography.

The stomach cancers in the patients in this study were far enough advanced so that they could be diagnosed by X-ray and clinical methods. In one case, however, it was not possible to tell by X-ray and other usual methods whether the patient had stomach ulcer or stomach cancer. In this patient, the chromatogram of the stomach juice resembled that of the other patients with stomach cancer.

Whether this method will prove an aid to early detection of stomach cancer can only be discovered by further studies, Dr. Warren and associates state in their report to the JOURNAL OF THE NATIONAL CANCER INSTITUTE (Dec. 1951).

Science News Letter, March 1, 1952

VETERINARY MEDICINE

Cattle Owners Underrate Need for Strict TB Control

➤ CATTLE OWNERS have been underrating the need for strict, continuing eradication measures against tuberculosis, the American Veterinary Medical Association in Chicago charged.

In a few sections of the country, bovine tuberculosis is definitely on the increase, although the overall U. S. rate for the disease in 1951 is the lowest since 1943.

The Association urged the cooperation of all farmers and veterinarians in continued testing of cattle and the elimination of all animals that react to the tuberculin test. Bovine tuberculosis is communicable to humans.

Science News Letter, March 1, 1952

The world's largest flesh-eating *mammal* is the Kodiak brown bear.

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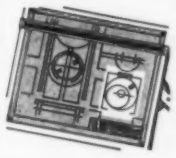

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WILDLIFE

NATURE RAMBLINGS

Whooping Crane

► WE HEAR much about the great slaughter of passenger pigeons that took place during the early days of the last century, resulting at last in the total extermination of the species.

Less is said about several other birds native to America which have been pushed very near to the doors of final doom; so near that not only the average citizen, but the average professional naturalist, never gets to see them in the wild.

One such is the whooping crane, a great white bird once fairly common all along the Atlantic and Gulf coasts. Early records attest to the presence of this bird as far north as New England, where it was harried and driven out because it stole corn.

Now only a few of the birds still survive, and they are fighting a battle against extinction. The whooping crane might not have survived, but perished like the incomparably more numerous passenger pigeon, except for the fact that, like all cranes, it is a rather canny bird. The passenger pigeon had no more sense than any other pigeon and flew in clouds over towns blazing with guns and into trees set with nets. The longer-lived crane looked about him more wisely, learned something of man and his destructive ways, and finally came to shun him like the plague.

Another reason for the continued survival of the last few of these fine birds is the nature of their habitat. They are marsh-dwellers, nesting and picking up their living in regions where few human beings care to go, even if they are able. Recently, for deciding to build a dock on the opposite side of the marsh that is the chosen winter habitat of the few remaining whooping cranes, two oil and gas companies were presented a citation of merit from the National Audubon Society.

The two companies, acting within their rights under terms of lease, had wanted to build a loading dock on the edge of the cranes' wintering marsh, with a pipeline and road crossing to it from the other side of the Arkansas National Wildlife Refuge in Texas. After being advised by the U. S. Fish and Wildlife Service, they decided to build the dock some distance away, even though substantial increase in expenditure was involved.

"It is extremely heartening to the Society," John H. Baker, president of the Society, said in presenting the award, "that in this instance the natural desire to market oil and gas in the most economical manner has been tempered with genuine concern for the preservation of a magnificent bird that is fighting for survival. Any serious disturbance to the cranes' habitat at this time might swing the pendulum toward extinction."

The most important news about the whooping cranes, Mr. Baker reports, is the fact that the wild birds again brought back from the North five young whooping cranes born during the past year.

Science News Letter, March 1, 1952

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MEDICINE

ACTH Gets Asthma Victim Off Morphine Safely

► A 71-YEAR-OLD morphine addict was rapidly gotten off his morphine without the usual withdrawal symptoms by the use of the pituitary gland hormone, ACTH.

This use of the hormone, famous for the relief it brings in cases of arthritis, asthma and various other conditions, is reported by Dr. Samuel E. Di Figlia of Corona, N. Y.

The patient had suffered from bronchial asthma since childhood. He got the morphine habit 12 years ago when he was in the hospital eight months with a broken leg. The morphine was used then to control the pain and the asthma.

For a month before Dr. Di Figlia saw him, the patient had required half a grain of morphine plus adrenalin every four hours and had refused all food. He was in such poor physical condition that the doctor was afraid he would not survive the shock of morphine withdrawal. While arrangements were being made to get him into a hospital, ACTH was cautiously injected. He brightened visibly. A second dose was given six hours later, after which the patient asked for food for the first time in a month.

The doctor then decided to continue ACTH treatment at home. On the second day the patient was up and about and free of asthma; the fourth day he was off the morphine and the adrenalin. The ACTH was stopped within two weeks.

The case is reported officially to fellow physicians in the NEW YORK STATE MEDICAL JOURNAL (Feb. 15).

Science News Letter, March 1, 1952

INVENTION

Keep Rice Bran Oil Fresh

► A NEW and better way has been found to keep the oil in rice bran from turning rancid. This means that more nutritious brown rice can be stored for much longer periods, that the rice bran can be used as cattle fodder and that the edible oil can be more easily and economically extracted from the bran.

The method received a patent recently. Its inventors, scientists at the Department of Agriculture's Western Regional Research Laboratory, Albany, Calif., are Drs. Ernest B. Kester and Harold S. Olcott, and George R. Van Atta, all of Berkeley. Their patent, number 2,585,978, has been assigned to the Department.

The scientists discovered that merely by blanching the freshly harvested rough rice with steam or a steam-air combination, the lipase in the oil, which makes it rancid, is substantially inactivated.

The rice is subjected to the steam at temperatures of from 185 to 212 degrees Fahrenheit, for periods of one to 15 minutes. Then it is dried until it contains between 10% and 15% moisture.

For storage, rice is usually dried out to this stage to prevent spoilage by spontaneous heating and fermentation.

A comparison between ordinary dried out rice and rice which had first been blanched and then dried showed that, after eight weeks of storage, the ordinary rice had 6.6% of fatty acid in its oil, while the treated rice had only .5% to .6%. It is the swift increase of fatty acid as a result of lipase activity which makes the rice malodorous and unusable.

The inventors say that this instability of the oil has plagued the rice industry for many years. With this system for licking the instability, crude, neutral, edible oil can be extracted from the rice bran, the bran can be used as cattle fodder and brown rice will be much more readily available as a food for humans.

Science News Letter, March 1, 1952

Books of the Week

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AUDITORY TRAINING FOR THE DEAF—Mary Wood Whitehurst and Edna K. Monsees—*The Volta Bureau*, 99 p., paper, $3.12. For persons with some residual hearing who suffer their impairment before they learned to speak.

BUILD-IT-YOURSELF RANCH-TYPE HOUSE—Tom Riley—*Popular Mechanics*, 132 p., illus., paper, $3.50. The author built this $4,950 home with the aid of his wife. The book is illustrated with photographs of the steps of construction.

CANCER ILLNESS AMONG RESIDENTS OF DENVER, COLORADO — Samuel C. Marcus — *National Cancer Institute*, 39 p., paper, free upon request to publisher, Bethesda 14, Md. This survey, compared to one made in 1939, shows an increase of incidence, especially in cancer of the lung, but part of the increase may be due to better diagnosis and reporting.

DIRECTORY OF COLLECTIONS AND LIST OF SPECIES MAINTAINED IN THE UNITED KINGDOM AND THE CROWN COLONIES—Permanent Committee, British Commonwealth Collections of Micro-Organisms—*Her Majesty's Stationery Office*, 59 p., paper, $1.35. The collections include algae and protozoa, bacteria, fungi, viruses, bacteriophages and yeasts.

THE FALSE SPIDER MITES OF CALIFORNIA: (Acarina: *Phytoptipalpidae*) — A. Earl Pritchard and Edward W. Baker—*University of California Press*, 49 p., illus., paper, $1.00. Some of the species described are serious pests in California.

THE FORGOTTEN LANGUAGE: An Introduction to the Understanding of Dreams, Fairy Tales, and Myths — Erich Fromm—*Rinehart*, 263 p., $3.50. Helping the student of psychiatry or psychology and interested laymen to understand the symbolic language which, the author says, is the only universal language the human race ever developed.

GENERAL BACTERIOLOGY LABORATORY MANUAL—L. S. McClung — *Saunders*, 2d ed., 134 p., paper, $2.50. A workbook for classes in introductory bacteriology.

A HISTORY OF THE THEORIES OF AETHER AND ELECTRICITY: The Classical Theories—Sir Edmund Whittaker—*Philosophical Library*, 434 p., $12.00. The recent re-birth of this theory makes the present volume very timely.

JANE WALKER'S BOOK OF ART LECTURES FOR LIPREADING PRACTICE—Sanzoray Club, Ed. —*The Volta Bureau*, 61 p., illus. by packet of color prints, paper, $3.12. The author, herself deaf, for 30 years before her death headed art classes for speech-readers at the Metropolitan Museum of Art.

JEFFERSON—Saul K. Padover—*New American Library*, 192 p., paper, 35 cents. Biography of a man who was scientist and educator as well as statesman. Especially abridged by the author from an edition originally published by Harcourt, Brace and Company.

LABORATORY EXERCISES IN GENERAL BIOLOGY—James Watt Mavor—*Macmillan*, 4th ed., 333 p., illus., paper, $3.50. Designed to accompany the author's General Biology.

MANPOWER, CHEMISTRY, AND AGRICULTURE; Report of the Subcommittee on Labor and Labor-Management Relations—Francis Joseph Weiss —*U. S. Senate Committee on Labor and Public Welfare*, 54 p., illus., paper, free on request to publisher, Capitol, Washington 25, D. C. Use of chemicals on the farm is expected to lessen the need for farm labor and result in a new movement of people away from rural areas.

MULTIPLE VALUED HARMONIC FUNCTIONS WITH CIRCLE AS BRANCH CURVE — Siegfried F. Neustadter—*University of California Press*, 35 p., paper, 50 cents.

PALOMAR OBSERVATORY—Dinsmore Alter and Clarence H. Cleminshaw—*Griffith Observatory*, 75 p., illus., paper, 90 cents. A description, beautifully illustrated, of the "Big Eye," and other important instruments at Palomar. Includes a description of the principle of the Schmidt telescope.

A SEX GUIDE TO HAPPY MARRIAGE—Edward F. Griffith—*Emerson Books*, 352 p., illus., $3.00. For those about to be married and for married people who want practical advice. The book has gone to 25 editions in England before this revised American edition was prepared.

THE SHRUBS OF PENNSYLVANIA—William Carey Grimm—*Stackpole*, 522 p., illus., $5.00. A field guide for laymen interested in wild shrubs.

SPEECH TRAINING: A Handbook for Students—A. Musgrave Horner—*Philosophical Library*, 176 p., illus., $3.75. For teachers and students, with material for practice.

WE ARE A FAMILY—Inez Hogan—*Dutton*, 93 p., illus., $2.75. Giving children a pleasant account of family life among five different kinds of animals.

WORLD CARTOGRAPHY; Volume I, 1951—*United Nations* (*Columbia University Press*), 107 p., illus., paper, $1.25. Reporting activities, progress and plans throughout the world.

Science News Letter, March 1, 1952

Traffic in mid-town New York City moved twice as fast in horse-drawn days as it does now in automobile days, a traffic engineer recently stated.

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MEDICINE

Signs Tell Whether Paralysis Cure Probable

➤ IN A patient who has had a "stroke" paralyzing one side of his body, here are signs which, if they appear early, point toward a good recovery:

1. Fingers will flex if they are tapped lightly even when the patient cannot yet flex them at will.

2. All arm bending muscles will contract actively when passive traction is applied to these flexing muscles.

The first is an example of a "proprioceptive response." The second is an example of a "proximal traction response."

Studies showing that early return of these two is a good sign of ultimate complete recovery have been made by Dr. Thomas E. Twitchell of Boston City Hospital and Harvard University.

In patients who recovered completely, the first sign appeared within nine and the second within 15 days following the stroke of paralysis.

Remedial exercises aimed at retraining movement should, Dr. Twitchell's studies show, be timed and conducted so as to call forth the optimum proprioceptive and touch reactions. Fellow neurologists will read details of the studies in the scientific journal, BRAIN (Part IV, 1951).

Science News Letter, March 1, 1952

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CABINET MEMBER: "It should bring to light some valuable ideas which might otherwise not have been known."

AN INVESTMENT COUNSELOR: "I can imagine the great surge of hope now going through the breasts of the young men specializing in this field. 'Here,' they will say, 'is a corporation willing to give us a break.' . . . Its fundamental unselfishness cannot fail to strengthen the faith of those without property. . . . This is opportunity!"

AN AIR FORCE GENERAL: "I have read of your plan for encouraging invention and offering a testing ground for ideas. Such a project seems to me both practical and inspirational!"

Men Who Know the Importance of Independent Invention Encourage You to Use the Sinclair Plan

A CABINET MEMBER: "The provisions regarding patents are unique . . . the compensation for your investment of money, time, and facilities would be limited to nonexclusive, royalty-free shop rights for your company."

A MEMBER OF THE JOINT CHIEFS OF STAFF: "The Sinclair Oil Corporation is performing another fine public service in opening its research laboratories to the American inventor. I am confident that the nation will derive many benefits from this selfless service."

PRESIDENT OF A BROADCASTING NETWORK: "To make the magnificent facilities of the Sinclair Research Laboratories available to inventive Americans under what would seem to be a very fair arrangement is a constructive and forward-looking step."

PRESIDENT OF LARGE MANUFACTURING CORPORATION: "We all think the plan, which opens wide the doors of your great research laboratories, should indeed encourage individual inventors."

AN AIR FORCE GENERAL: "I wholeheartedly agree that there is a need to help the independent inventor because of the complexity of modern technology and the prohibitive cost of these facilities. Your farsighted plan is a great stride in relieving this situation."

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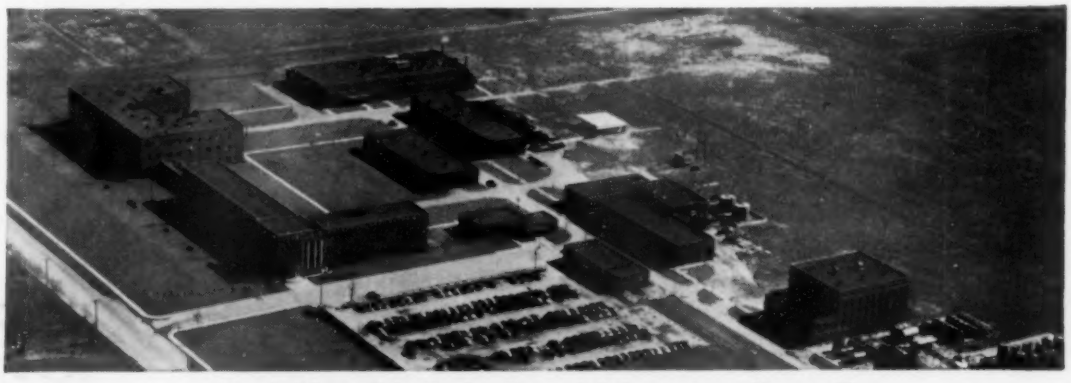
If you have an idea for a new or improved petroleum product or application, you are invited to submit it to the Sinclair Research Laboratories. In your own interest, each idea must first be protected by a patent application or a patent. If the laboratories select your idea for development, they will make a very simple arrangement with you: In return for the laboratories' work, Sinclair will receive the privilege of using the idea for its own companies, free from royalties. This in no way hinders the inventor from selling his idea to any of the hundreds of other oil companies for whatever he can get. Sinclair has *no control* over the inventor's sale of his idea to others, and has *no participation* in any of the inventor's profits through such dealings.

HOW TO PARTICIPATE: Instructions are contained in an Inventor's Booklet. Write to W. M. Flowers, Executive Vice-President, Sinclair Research Laboratories, Inc., 600 Fifth Avenue, New York 20, N. Y.

IMPORTANT: *Please do not send in any ideas until you have sent for and received the instructions.*



Nine buildings of the Sinclair Research Laboratories at Harvey, Ill.

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⚙ *REFLECTING GLOVE for the automobile driver, recently patented, aids following drivers to see hand signals at night. It is of conventional appearance and made of conventional materials but has a coating on the rear side that is highly reflective and completely flexible.*

Science News Letter, March 1, 1952

⚙ *TIE CASE, designed to keep neckties pressed, clean and free from dust while traveling, has two panel-rack tie carriers, one fitting in the bottom of the case, the other in the cover. Each holds four ties by means of slots into which the neckband portions are placed.*

Science News Letter, March 1, 1952

⚙ *SOUND-ABSORBING BAFFLES, designed to hang from wires stretched near the ceiling in a factory, are made of glass fiber enclosed in a plastic film. They are intended for rooms where standard acoustic ceiling is difficult to install because of ceiling fixtures.*

Science News Letter, March 1, 1952

⚙ *LOUDSPEAKER, EMPLOYING an electronic principle, has no conventional diaphragm but utilizes a platinum electrode heated to a high temperature. The heated electrode produces an ionic cloud which responds to changes in the strength of a high frequency electric field to produce sound waves.*

Science News Letter, March 1, 1952

⚙ *ELECTRONIC STETHOSCOPE for the doctor, shown in the photograph, is especially useful when examining patients whose chest sounds are difficult to hear.*

This pocket-size instrument, containing both microphone and speaker, is powered by flashlight batteries and is attachable to the regular binaurals.

Science News Letter, March 1, 1952

⚙ *PROTECTIVE COATING for tank trailers used to transport fuming nitric acid is a new fluorinated plastic resin applied as a lacquer that is not injured by spilling acid. Because of its resistance to acid, heat and moisture, it is an ideal coating for electrical equipment.*

Science News Letter, March 1, 1952

⚙ *SAND PACKER for treating foundation materials for roads and airports, to replace heavy rollers now used, is called a vibration compactor and weighs only 6.6 tons. Forces applied at the surface by a vibrating steel plate shake the foundation sand and move its constituent particles together.*

Science News Letter, March 1, 1952

⚙ *ROLL-UP DOORS for garages and shops, which roll up like a curtain, are long-used types with interlocking steel slats, now made with heavy-duty transparent plastic slats replacing some of the steel slats. The transparent slats permit daylight to enter and a person on the inside to look out.*

Science News Letter, March 1, 1952

Do You Know?

U. S. *population* has increased roughly sixfold in one century.

About 65% to 70% of the dry weight of a *plant* consists of starch; the rest of it consists of mineral elements.

Nine men were needed to unpack a 19-foot, 100-pound, squirming *Regal Python* at the Philadelphia Zoological Garden.

The decay of *floor beams* in houses without basements but with a crawl space between floor and the earth can be prevented by covering the soil under the floor with roofing paper.

Rubies and sapphires are manufactured in large quantities from aluminum oxide.

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